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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PREM MENON,
JOHN J. CONLEY, DAVID A. MASTEN,
and BRUCE J. CLINGERMAN

Appeal 2012-003676
Application 11/671,379
Technology Center 1700

Before ADRIENE LEPIANE HANLON, HUBERT C. LORIN, and GEORGE C. BEST, *Administrative Patent Judges*.

BEST, Administrative Patent Judge.

DECISION ON APPEAL

On February 2, 2012, the Examiner finally rejected claims 1-4 and 15-17 of Application 11/671,379 under 35 U.S.C. § 103(a) as obvious. Appellants[1] seek reversal of these rejections pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we REVERSE.

BACKGROUND

The '379 application describes "a fuel cell system that employs wax elements as passive control devices to control certain system components, such as coolant fans, coolant pumps and valves in the system." Spec. ¶ [0001]. In particular, the system uses expansion and contraction of the wax to operate an electric switch to control various devices in the system. *Id.* at ¶ [0007].

Claim 1 is the only independent claim in the '379 application and is reproduced below:

> 1. (Previously Presented) A fuel cell system comprising:
>
> a fuel cell stack including a stack of fuel cells; and
>
> a cooling system for cooling the fuel cell stack,
>
> said cooling system *including a cooling line delivering cooled cooling fluid to the stack and removing heated cooling fluid from the stack*,
>
> said cooling system further including a wax element device *positioned within the cooling line*,
>
> said wax element device including
>
> a container mounted to the cooling line,

[1] GM Global Technology Operations LLC is identified as the real party in interest. (Amended Appeal Brief ("App. Br.") 3 (August 1, 2011).)

> a wax element positioned within the container and a rod mounted to the wax element and extending out of the cooling line,
>
> said wax element expanding and contracting in response to temperature changes to the cooling fluid,
>
> said rod moving in response to the expansion and contraction of the wax element to provide control of at least one fuel cell system device.

(App. Br. 7-8, 10 (Claims App'x) (some paragraphing and indentation added, disputed limitations italicized).)

REJECTIONS

On appeal, the Examiner maintains the following rejection:

Claims 1-4 and 15-17 are rejected under 35 U.S.C. § 103(a) as obvious over Clingerman[2] in view of Sliger.[3] (Ans. 5.)

DISCUSSION

Appellants' argue for reversal of the Examiner's rejection based upon the limitations in claim 1. (*See* App. Br. 5-9.) Therefore, our discussion is limited to claim 1, and claims 2-4 and 15-17 stand or fall with claim 1.

Appellants admit the Clingerman describes a fuel cell assembly that includes a fuel cell stack comprised of fuel cells. (App. Br. 5.) The fuel cell assembly further includes a pair of coolant pumps. (*Id.*) The first coolant

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[2] U.S. Patent No. 6,743,539 B2, issued June 1, 2004.

[3] U.S. Patent No. 3,771,088, issued Nov. 6, 1973.

pump moves coolant through a high temperature coolant loop and the fuel cell stack. (*Id.*) The second coolant pump moves coolant fluid through a low temperature coolant loop. (*Id.*) Clingerman's fuel cell assembly further comprises a first temperature sensor that measures a temperature near the fuel cell stack and a second temperature sensor that measures the temperature of the coolant in the low temperature coolant loop. (*Id.*) The Examiner further found that Clingerman describes the use of data from the second temperature sensor to control the operation of a fan. (Ans. 5 (citing Clingerman col. 5, ll. 1-30).)

Appellants also admit that Sliger describes an electrical switch having a pair of electrical contacts on a piston. (App. Br. 5.) The piston moves based on the expansion and contraction of a thermally expansive wax-based material. (*Id.*) Movement of the piston makes and breaks electrical contacts. (*Id.*)

Appellants argue that the rejection should be reversed for several reasons. This appeal, however, may be resolved by consideration of a single argument: Appellants argue that the Examiner has not established a prima facie case of obviousness because the prior art does not describe or suggest the positioning of the wax element device in the cooling line that circulates coolant through the fuel cell stack. (App. Br. 6-7.) In response to this argument, the Examiner identified the thermostat in Clingerman's low temperature coolant loop as the cooling fluid sensor within a line that delivers coolant to a fuel cell stack. (Ans. 7 ("This element is the temperature sensor 48 . . . and is taught by Clingerman as in the coolant loop for the fuel cell (Abstract; Fig. 1; 4:20-35).").)

The Examiner's argument is based upon a misapprehension of the structure of Clingerman's fuel cell assembly. Clingerman expressly

describes temperature sensor 48 as located within the low temperature coolant loop. Clingerman Figure 1; col. 4, ll. 7-34. The low temperature coolant loop, however, does not supply coolant to the fuel cell stack. *Id.* Rather, the low temperature coolant loop circulates coolant through various components of the fuel cell power plant, including a motor, a motor controller, and electrical components. *Id.* at col. 4, ll. 7-12. Clingerman expressly describes supply of the coolant to the fuel cell stack via the high temperature coolant loop, not the low temperature coolant loop. *Id.* at col. 2, ll. 45-52; col. 3, ll. 20-29.

Due to the Examiner's faulty understanding of Clingerman's structure, the Examiner has neither made factual findings nor articulated reasons why a person of ordinary skill in the art would have positioned Sliger's wax element sensor in a coolant line that provides coolant to and removes coolant from the fuel cell stack.[4]

Because the Examiner's rejection is based upon an erroneous factual determination, we reverse the rejection of claim 1 as obvious over

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[4] We note that Clingerman describes monitoring coolant temperature within the high temperature coolant loop. Information regarding the coolant temperature is used to control the position of a diverter valve that directs a variable portion of the coolant to a radiator. *See* Clingerman, col. 2, l. 53-col. 3, l. 45. The Examiner did not argue that a wax element sensor could be used in this application, and we express no opinion in that regard.

We also express no opinion regarding the contents of U.S. Patent No. 4,262,274 or U.S. Patent No. 4,225,841, which were not identified by the Examiner as being part of the basis for rejection of the '379 application's claims. *See In re Hoch*, 428 F.2d 1341, 1342 n.3 (CCPA 1970) ("Where a reference is relied on to support a rejection . . . there would appear to be no excuse for not positively including the reference in the statement of the rejection.").

Clingerman and Sliger. The remaining claims in the ’379 application depend from claim 1. Thus, we also reverse the rejection of these claims.

CONCLUSION

For the reasons set forth above, we reverse the Examiner’s rejection of claims 1-4 and 15-17 of the ’379 application as obvious over the combination of Clingerman and Sliger.

REVERSED

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